



## 3-D Printing revolutionizing rehabilitation

Rock Hill area VR clients are being introduced to the exciting, cutting-edge technology of three-dimensional printing, thanks to 3-D Systems in Rock Hill, a leading provider of 3-D printing design-to-manufacturing solutions. In addition to employment opportunities, this technology has immense potential in assistive technology products for people with disabilities.

"During the subassembly process for 3-D Systems, VR clients follow a highly technical multistep procedure where the skins [outer covers] of the printers are built," explains Phil Hall, Job Readiness Coordinator. Clients in the Rock Hill Work Training Center build around 10 skins a day. "This multistep process is one of the most challenging subassembly projects we have, which creates valuable training for our clients."

"The clients in the Work Training Center help provide the fine detail work for the look of the machines," says Debbi Beebe, Director, MJP Programs and Engineering Services. "We have hired several VR clients because they have become so efficient in this process."

"Our partnership with 3-D Systems has been very rewarding," adds Hall. "They have allowed us to grow with them and provide valuable training opportunities to VR clients for more than five years."

"We are constantly innovative and never allow ourselves to get stagnant," says Beebe. "Vocational Rehabilitation's Work Training Center helps streamline production and get new products off the ground."

"3-D Systems has partnered with VR on many levels including high level contract work and employment opportunities, plus providing tours for our High School/High Tech students," explains Tina Stuber, Business Development Specialist.



*EksoBionics exoskeleton helps people with lower-extremity paralysis walk.*

In 1983 Chuck Hull invented stereolithography (also known as optical fabrication), the process used to create a three-dimensional, solid object by laying down multiple layers of a material. Hull founded 3-D Systems and made this rapid prototyping available by 1986. The first 3-D printers were used to produce models and prototype parts for specific needs. Today, they are used to make everything from chocolate candy to aerospace components.

3-D printers are also revolutionizing the field of assistive technology. In

collaboration with EksoBionics, 3-D Systems recently printed a robotic suit that has enabled an individual who is paralyzed from the waist down to walk.

While robotic exoskeletons may sound complex, 3-D printers are also being used for other solutions. Paul McCarthy, from Marblehead Massachusetts, was researching assistive technology options for his son, Leon, who was born without fingers on one hand. After an exhaustive search, he found that there are limited options for pediatric prosthetics due to the small number of children with upper-extremity amputations.

That's when McCarthy came across rapid prototyping. It started with a video posted on YouTube giving instructions on how to use a 3-D printer to make a prosthetic hand. The design relies on wrist movement. Downward motion creates cable tension which closes the fingers, while a move upwards opens them

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move upwards opens them.

McCarthy borrowed a friend's 3-D printer, and in a month learned how to string, screw and bolt together what he and his son describe as the "Frankenstein" hand.

Leon admits that at first he thought the idea was crazy, but once it was assembled he said the hand was "awesome." His new hand gives him the ability to carry out tasks such as picking up a water bottle and a pencil.

"This thing cost us \$5-10. It was nothing," said McCarthy. "A prosthesis would have cost the family upwards of \$30,000."

Months before Leon and his father discovered 3-D printing, Michael Morgan, SCVRD Information Technology Training Center (ITTC) Instructor, realized that providing the ability for the AutoCAD students to rapid prototype their designs into reality needed to be a priority.



*Leon McCarthy using his 3-D printed hand at school.*

"The goal was to be able to produce machine parts as part of the pre-manufacturing process," explains Morgan.

The ITTC students also learned of Leon's story.

"The potential of rapid prototyping for assistive technology grabbed the hearts and minds of everyone at the training center," states Matt Daugherty, ITTC Program Coordinator.

One week after the 3-D printer arrived, the students had pulled the same plans from the internet that McCarthy had used and produced a fully-operational prosthetic hand.

Tom Jackman, Rehabilitation Technology Engineering Supervisor, was quickly invited over to see the new machine and hear Leon's story.

"I can see many opportunities in the future for these students to assist us in our fabrication efforts, as well as when we develop unique custom devices for our clients to use in the employment setting," says Jackman.

Through the partnership with 3-D Systems, VR clients today receive valuable training and employment opportunities, while the future promises new breakthroughs in assistive technology.

"We truly enjoy a win-win partnership with 3-D Systems," says Stuber.

View [Leon's story on YouTube](#).

Read how [3-D Systems first Hybrid Robotic Exoskeleton is enabling Amanda Boxtel to walk tall](#).

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## Around the state

### DDS employees recognized for outstanding performance

Vickie D Stewart, Team Supervisor in the Charleston Disability Determination Services (DDS) office, and Kevin Robinson, Central Control Specialist in the Columbia DDS, were recently awarded Social Security Administration Associate Commissioner DDS Honor Awards.

Vickie Stewart was awarded an Associate Commissioner Citation for her exceptional



Commissioner citation for her exceptional initiative and drive in the development, testing and piloting of a review system to track supervisory reviews of examiner performance. The system provides a means to obtain reliable evidence necessary for developing targeted feedback and training. Identifying and remediating errors as early as possible in the disability process enhances quality and reduces processing time.



Kevin Robinson was crucial in the implementation of an automated process that sends a detailed status report to the legal representatives of individuals applying for Social Security disability benefits. When DDS received the system enhancement allowing the creation of the automated status reports, Kevin recognized that the approach would not be successful unless extensive outreach was performed with the legal community. He took the initiative to notify all legal representatives of the new process. He maintains the list of legal representatives and sends the automated report twice monthly and works directly with the representatives statewide to resolve any problems.



The automated status process has been very effective at reducing the number of calls and faxes by individual legal representatives to the DDS call center and individual examiner staff, resulting in a more efficient use of staff time and resources.

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## Referral champions

The Bryant Center recently presented a Referral Champion award to the entire staff of the Gaffney, Union and Spartanburg area offices for their continued good work in referring clients to the Bryant Center.

"We wanted to congratulate them and let them know we appreciate their work in serving clients who need Comprehensive Services," says Jennie Thomas, Bryant Center area supervisor.

*Photo: Jennie Thomas (left), area supervisor of the Bryant Center, and DeCole Gallman, Spartanburg area supervisor.*



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## New opportunities for transition students in Abbeville High School

Abbeville High School was selected from among fifteen high schools to receive technical assistance to improve the transition from school to work.

receive technical assistance to improve the transition from school to work for students with intellectual disabilities through a grant funded by the SC Developmental Disabilities Council. The South Carolina Secondary Transition & Employment Advancement Model (SC-TEAM), a research to practice project focused on best practices in the transition from high school to adult life—particularly transitioning from school to work, will administer the grant.

SC-TEAM will work with Abbeville High School, SCVRD Transition Counselor Trisha Miller, Family Connections, Able SC and the SC Department of Disabilities and Special Needs (SCDDSN) to develop a student-centered transition assessment and planning best practice model. The goal is to improve the lives of students with intellectual and developmental disabilities through collaboration with school staff, family, and community resources working together with the student to help him or her achieve their goals for life after high school.

SC-TEAM is a collaborative project between the Center for Disability Resources (CDR) at the University of South Carolina School of Medicine and the Department of Educational Studies at the University of South Carolina (USC).

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## Did you know...

...that in the late 1940's the prevalence of tuberculosis in South Carolina was so great that SCVRD had a counselor dedicated to serving clients at the South Carolina Sanatorium for TB patients?



Many patients at the Columbia facility received occupational therapy at bedside or in workrooms in preparation for their return to work. Skills developed included watch repair, wood work, leather crafting, and photography/film developing.

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## Events

### Lexington

- February 24, 2 pm - 6 pm- **College Fair**. The following colleges are scheduled to participate: Midlands Technical College, College of Charleston, Virginia College, Central Carolina, Spartanburg Methodist and USC's Life Program. This event is geared towards transition students and assisting them with the process of higher education leading to competitive employment.
- March 20 - **Job Fair**.  
*For more information, call 803-896-6333 or 866-206-5184*

### Gaffney

- March 12, 9 am - 12 noon - **Job Fair**.  
*For more information, call 864-489-3306*

### Oconee Pickens

- March 12, 9 am - 11:30 am - **Job Fair**. The following businesses will be present to discuss potential job opportunities: Aramark, Wal-Mart, Seneca Health & Rehabilitation, Lowe's, US Engine Valve, and others.  
*For more information, call 864-882-6669*

### Spartanburg

- March 13, 10 am - 3 pm - **Job Fair**. The following businesses are scheduled to participate: Zaxby's, Lowe's, Firehouse Subs, Cintas, Waffle House, Phillips Staffing, Spartan Staffing, and OpSource.  
*For more information, call 864-585-3693 or 866-451-1480*

## Enabling eligible South Carolinians with disabilities to prepare for, achieve and maintain competitive employment

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